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NASA commits to President Bush's management plan

NASA has committed to moving as quickly as possible in removing barriers to more efficient management as outlined in the President's Management Agenda.

During a nationwide address to employees on NASA TV last month, Administrator Sean O'Keefe reinforced his support of the Freedom to Manage (F2M) initiative, an effort to deliver higher performance throughout the federal government.

To further underline his dedication to the initiative, the Administrator has formed a task force to identify impediments to effective and efficient management.

"I have made it a high priority in requesting your suggestions for changing rules, regulations or procedures that will allow our managers more flexibility to do their jobs," said O'Keefe. "And, from the more than 330 suggestions, our task force has drafted a set of 18 F2M legislative proposals to present to Congress."

For the next step, O'Keefe said he has charged the task force with focusing on

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Engineers at Stennis Space Center completed an activation test of the Integrated Powerhead Demonstration (IPD) project's liquid hydrogen fuel pump turbine drive system June 6. The 30-second test burned gaseous hydrogen, used to spin the turbine on the IPD's liquid hydrogen pump, into the atmosphere.

Testing of new propulsion system under way

Testing of the Department of Defense's Integrated Powerhead Demonstration (IPD) project, developed by the Air Force Research Laboratory (AFRL) Propulsion Directorate, Edwards Air Force Base, Calif., is under way at Stennis Space Center's E-1 test facility. The IPD engine program contributes technologies to NASA's Space Launch Initiative (SLI), a program aimed at improving the safety, reliability

and cost effectiveness of the next generation of reusable launch vehicles for space travel.

"The IPD program supports the Department of Defense Integrated High Payoff Rocket Propulsion Technology Program (IHRPT)," said AFRL's Capt. Jeffery Thornburg, IPD project manager.

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NASA astronaut Franklin Chang-Diaz, left, and astronaut Philippe Perrin of CNES, the French Space Agency, work in tandem on the first scheduled session of extravehicular activity for the STS-111 mission.

The Space Shuttle Endeavour, launched from Kennedy Space Center on June 5 on a flight that brought to a close the longest stay yet aboard the complex for a resident crew, landed June 19 at Edwards Air Force Base, Calif.





Five Stennis Space Center employees were recently honored with NASA's Space Flight Awareness Award. The award program was established to prevent human error by instilling in civil service and contractor employees an awareness of personal responsibility for shuttle missions. Honorees attended an awards luncheon at Kennedy Space Center earlier this month. Recipients include, from left, The Boeing Company's Robert Walker, Lockheed Martin Space Operations' Gerald Howard, NASA's Terry Bordelon, Mississippi Space Services' Roger Clements and Lockheed Martin Space Operations' Randy Taylor.

Stennis moves toward next step in IFMP

Stennis is gearing up to take the next step in the Integrated Financial Management Program (IFMP) with the implementation of an automated travel manager system. IFMP is a very large, comprehensive automation program aimed at standardizing many functions across NASA. The system will provide the NASA travel community another new tool to improve efficiency in an environment of shrinking resources and increasing time constraints.

"IFMP is rapidly affecting all of us here at Stennis," said NASA's David Carstens, deputy director, Center Operations and Support Directorate and IFMP manager. "We recently implemented WebTADS as our new automated time and attendance system and soon will use the travel manager to electronically

process our travel orders and vouchers."

The travel manager system, according to Carstens, will be implemented electronically.

"Some areas that will be improved with the implementation of travel manager include systems with limited reporting and data access, manual preparation of travel documents, manually reviewing, approving and signing travel documents and manual auditing of travel documents," said Carstens. "NASA employees will use a standardized, fully integrated, comprehensive package — Gelco's Travel Manager Plus — that is responsive to their needs and provides timely, up-to-date information.

Access to the application will be provided via the Web.

NASA celebrated Old Timers' Day on May 17. The event commemorated the first tree cutting May 17, 1963, that began the clearing of land for a national rocket test facility in the state. From left, retirees J. D. Cockrell, and Doug and Wanda Howard make their selections from the dinner buffet.



NEWSCLIPS

NASA selects scientists for Mars

mission: NASA has selected 28 scientists for participation in the 2003 Mars Exploration Rover (MER) Mission. The mission consists of two separate, though identical, rovers scheduled for launch in mid-2003 and for arrival at separate destinations on Mars in early 2004. The selected proposals were among 84 submitted to NASA last December. Selected investigators will work with the MER Program Office at NASA's Jet Propulsion Laboratory, Pasadena, Calif., and will become full MER science team members, joining previously selected scientists as part of the Athena science team.

NASA engineers begin testing new

ARMOR: Engineers at NASA Langley Research Center, Hampton, Va., have begun testing a new thermal protection system technology called ARMOR, short for Adaptable, Robust, Metallic, Operable and Reusable. ARMOR is one of several new concepts for advanced thermal protection being investigated as part of NASA's Space Launch Initiative. BF Goodrich Aerostructures Group of Chula Vista, Calif., has fabricated several ARMOR panels for Langley. The damage-resistant, lightweight, metallic panels can be manufactured to be readily removed for inspection or repair. The development of a highly effective thermal protection system is an important step in the quest for routine, low-cost access to space.

NASA completes laboratory to test and develop advanced navigation system in second-generation reusable launch vehicles:

Combinations of Global Positioning System components and Inertial Navigation System components will enable a vehicle operating system to track where the vehicle is in space, what its trajectory is and how to adjust errors to stay on course. This advanced technology, developed at Marshall Space Flight Center, Huntsville, Ala., will lower operational cost and enhance the safety of reusable launch vehicles.

International Space Station Report

Holloway retires as manager of ISS program

Tommy Holloway, manager of the International Space Station Program Office at NASA's Johnson Space Center in Houston, has announced plans to retire, effective July 3. Holloway's deputy, William H. Gerstenmaier, will take over as program manager.

Holloway was named space station manager in April 1999 after serving as manager of the Space Shuttle program for nearly four years. He began his career with NASA in 1963, planning activities for Gemini and Apollo flights at what was then known as the Manned Spacecraft Center.

In 1989, he was named assistant director for the Space Shuttle Program for the Mission Operations Directorate. He served as deputy manager for program integration with the Space Shuttle Program and director of the Phase I Program of Shuttle-Mir dockings before being named Space Shuttle program manager in August 1995.

Gerstenmaier joined the Space Shuttle program in 1980, serving as propulsion flight controller. In 1992, he got his first managerial assignment for the Orbital Maneuvering Vehicle project. Gerstenmaier was selected in 1995 to be the operations lead in Moscow for the first phase of the Shuttle-Mir program, serving as lead for the ground control team.

In August 1998, he was named Space Shuttle Program integration manager, and in December 2000 he was selected deputy manager of the International Space Station Program. Since then, he's been responsible for the management, development, integration and operations of the orbiting research laboratory.

NASA honors Flag Day with special gift

NASA Administrator Sean O'Keefe led a delegation of astronauts in a special presentation of colors June 14 at the American Museum of Natural History's Rose Center for Earth and Space in New York.

An American flag, recovered from the site of the World Trade Center in the days following the Sept. 11 attacks on America, returned home after traveling nearly five million miles in space aboard the Space Shuttle Endeavour during the STS-108 mission in December.

The flag, damaged but intact, was pulled from the debris by the New York City Police Department. To honor the victims, families and those who helped in the rescue and recovery efforts of Sept. 11, NASA flew the recovered Stars and Stripes as part of the Agency's Flags for Heroes and Families campaign.

"The tradition of carrying American flags into space dates back to the very beginning of this historic Agency," said Administrator O'Keefe. "From the surface of the Moon to the uncharted regions of our galaxy, NASA has flown the American flag as a patriotic symbol of

truth, honor and justice. It is appropriate that we present this flag back to the city of New York on Flag Day."

The large American flag, along with other commemorative badges, patches and other items, was carried into space with nearly 6,000 smaller American flags that will be given to the victims' families in New York, Washington and Pennsylvania.

Astronaut Frank Culbertson served as Expedition Three Commander on the International Space Station and was the only American not on the planet at the time of the terrorist attacks. He captured the first dramatic images from space of the fires at the World Trade Center shortly before the buildings collapsed.

"From space, the astronauts get a unique view of our home planet, and the destruction was clearly visible from orbit. The events of Sept. 11 deeply affected them, as they did the entire nation," concluded Administrator O'Keefe. "We hope this campaign is seen as a fitting tribute from America's space program as the courageous people of New York move forward."



With a \$3.5 million refurbishing project on the A-2 test stand at Stennis Space Center begun, the first test of a Space Shuttle Main Engine (SSME) on the A-1 test stand since August 1997 was conducted Monday, June 10. The of the A-2 test stand's refurbishment which includes asbestos removal, painting, control systems upgrades and replacement of the test stand engine diffuser, is scheduled for completion by January 2003.

A Day in the Life of .

It's a bird, it's a plane....

Perhaps you've seen it float by your office window at Stennis Space Center — a huge ball on a string. What looks like a birthday party escapee, however, is no ordinary balloon. The floating ball is actually a radiosonde balloon, a sophisticated piece of equipment that measures air pressure, humidity and temperature as part of the Earth Science Applications Directorate's (ESAD) routine remote sensing verification and validation activities.

Stennis' ESAD manages NASA's Earth science applications program, which includes remote sensing applications. Remote sensing data, information about the Earth collected from distant vantage points, must be governed by data quality, and ESAD is charged with the validation and verification — the measuring and testing of — data quality.

"Remote sensing, like many other measurements, has inherent errors," said Dr. Bruce Davis, ESAD's acting chief of applications engineering. "The validation and verification activity at Stennis determines the amount of error and develops methods to correct errors in remote sensing instruments, making remote sensing results more useful to NASA scientists and the public who use the images in a wide range of applications."

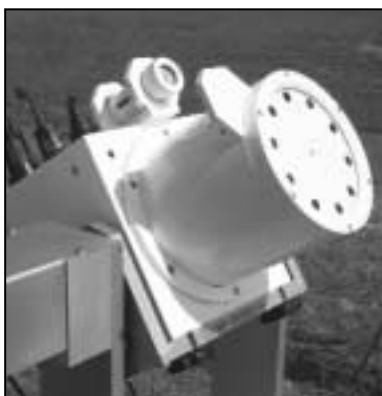
ESAD uses its unique engineering capabilities, including internal laboratory and field research capabilities, to perform verification and validation, also known as characterization, projects both on- and off-site. The space center's natural landscape and ESAD's on-site equipment and staff expertise make Stennis an appropriate testing location.

"Stennis' landscape contains unique features significant to remote sensing interests. The variety of land cover, including scattered buildings and roads, heavily



▲ **Richard Sellers and Brennan Grant, both of Lockheed Martin Space Operations (LMSO), prepare a radiosonde balloon as part of ESAD's verification and validation activities.**

► **LMSO's Steve Tate, Richard Sellers and Brennan Grant collect bi-directional reflectance data with a goniometer in support of ESAD's radiometric validation and verification.**



A sun photometer collects atmospheric data for NASA's remote sensing verification and validation activities.

wooded areas, reservoirs, canals, marshlands and grasslands, provides many natural features for the remote sensing characterization ESAD performs," said NASA's Vicki Zanoni, verification and validation projects manager at Stennis. "Using the land cover along with the appropriate instrumentation and expertise, our goal is to establish Stennis as a one-of-a-kind location for remote sensing validation and verification activities."

To perform the validation and verification of remote sensing data, ESAD engineers collect ground-based measurements at the time imagery is collected by sensors aboard aircraft and satellites. The ground data is compared to the acquired image to determine the accuracy of the sensors, which sense, near-infrared and thermal radiation

Measure for measure

ESAD characterizes several different types of remote sensing data, and concentrates on the assessment of spatial resolution, geolocation accuracy, and radiometric accuracy characteristics that are important to NASA scientists and other remote sensing data

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◀ LMSO's Randy Stewart and Josh Fairley prepare to deploy a float into the Stennis reservoir to collect water temperature data to support remote sensing thermal characterization.

phere complicates the measure of light reflected by the Earth's surface by reflecting and absorbing light itself, factors such as clouds, humidity and particles in the atmosphere must also be measured. The sun photometer, radiosonde balloon and multi-filter rotating shadowboard radiometer are some of the instruments engineers use to measure such atmospheric effects. The varying positions of the sun and the sensor overhead can also affect the accuracy of the reflectance measurement. An instrument called a goniometer is used to account for these factors. All of these measurements, along with complex mathematical formulas and models, help engineers determine accurate readings of reflectance.

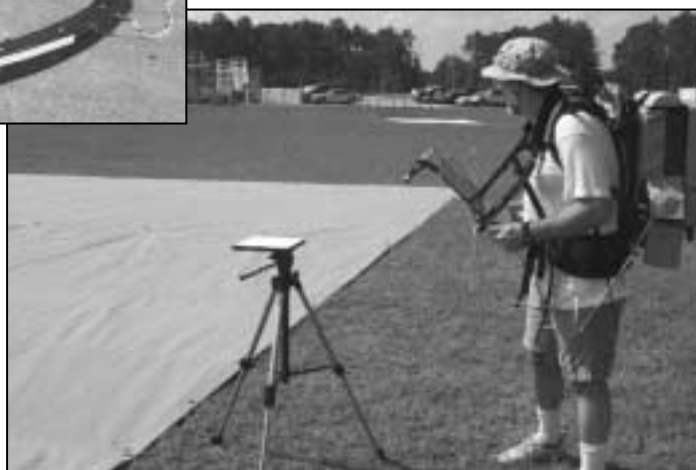
Geolocational characterization is the assessment of a sensor's accuracy in measuring the location of an object. Using Global

ability to measure fine details on the ground. Spatial resolution is often determined by assessing a sensor's accuracy in resolving the edge of a special target. ESAD scientists analyze remote sensing images of concrete targets or a series of on-site tarps, and the sensor's spatial response is determined mathematically.

Thermal characterization refers to a sensor's accuracy in the measure of surface temperature. Unlike radiometric measurements, which gauge reflected radiation, or energy, thermal characterization is the assessment of emitted radiation. The surfaces of water bodies provide an excellent source for thermal characterization. To measure water temperatures, ESAD launches a float equipped with radiometers and thermometers into an on-site reservoir. To characterize the thermal data, float measurements are compared with temperature measured by airborne and spaceborne sensors.



▶ LMSO's Kelly Knowlton uses a spectroradiometer to collect reflectance



Radiometric accuracy refers to the ability of a sensor to measure the light reflected by the Earth. To assess radiometric accuracy, ESAD first measures the reflectance of large uniform areas such as grass, concrete and deployable tarps using a hand-held instrument called a spectroradiometer. Because the atmos-

Positioning Systems, engineers accurately survey landmarks, often designated by geodetic targets, and compare those precise locations to the locations indicated by remote sensing imagery of the target to determine the accuracy of the image data.

Spatial resolution refers to the sensor's

Partnerships for success

NASA's ESAD office at Stennis has collaborated with the National Imagery and Mapping Agency and the United States Geological Survey (USGS) to establish the Joint Agency Commercial Imagery Evaluation (JACIE) team, for the independent, non-biased assessment of commercial remote sensing data. The three agencies jointly perform these characterizations and share and compare results.

The JACIE team sponsored a workshop, the 2002 High Spatial Resolution Commercial Imagery Workshop, March 25-27, at USGS headquarters in Reston, Va., to share the results of the team's characterization efforts.

For more information about ESAD's validation and verification activities, visit <http://www.esad.ssc.nasa.gov>.

NASA uses telemedicine to help doctors treat patients in Japan

A communications system arranged with the help of NASA's Stennis Space Center has enabled physicians at the University of Mississippi Medical Center (UMC) to guide surgery performed on patients in Japan.

Interventional radiologist Dr. Patrick Sewell at UMC agreed to help Japanese physicians who requested his assistance in performing clinical trials of his new image-guided interventional surgeries. Travel to Japan, however, was time-consuming and costly.

Sewell knew there must be a better way. He called on NASA's Bill Parsons, then the deputy director of Johnson Space Center, Houston and currently director of center operations and support at Stennis, to find a solution.

The answer to this communications challenge involves NASA-provided telecommunications and medical imaging linkups between UMC and two hospitals in Japan. At UMC, using teleconferencing and real-time magnetic resonance imaging (MRI) scans, Dr. Sewell directs the physicians in Japan in performing the minimally invasive surgical procedures.

Les Ridaught, a Stennis-based NASA Integrated Services Network (NISN) customer service representative for Marshall Space Flight Center, Huntsville, Ala., coordinated the technology mission to link UMC and the Japanese hospitals.

To accommodate the physicians' telemedicine needs, technicians traveled to Jackson to assemble the system at UMC. The



From left, Dr. Patrick Sewell, University of Mississippi Medical Center (UMC) interventional radiologist; NASA's Bill Parsons, director of center operations and support at Stennis Space Center; and Dr. David Dzielak, UMC associate vice chancellor for research, participate in a teleconference with doctors in Japan. (Photo: Jay Ferchaud, UMC.)

transmissions are fiber optic and travel over transoceanic cables at the speed of light. Such "terrestrial" transmission is faster than satellite transmission, which has a half-second delay. Along with audio transmissions, a large, flat-screen monitor reveals the patient and doctor in Japan to doctors at UMC. A picture-in-picture, or PIP, displays MRI images of the patient.

See **SURGERY** Page 7

ESAD assumes management of Stennis magnetometry facility

A recent Memorandum of Agreement between NASA and the United States Geological Survey (USGS) has transferred oversight of the on-site magnetic observatory, formerly administered by the Naval Research Laboratory, to NASA's Earth Science Applications Directorate (ESAD) at Stennis Space Center.

Magnetic data will be collected and reported to the National Geomagnetic

Information Center (NGIC), a division of USGS, which will use the information for magnetic calibration activities.

Magnetic calibration, the adjustment of magnetic instrumentation according to the changes in Earth's magnetic forces, requires the collection of magnetic data from observatories around the world. The data is collected at non-magnetic buildings and reported in near-real time to

NGIC via satellite.

"Our immediate goal will be to explore the prediction of magnetic anomalies that can disrupt satellite operations," said NASA's Dr. Marco Giardino of ESAD at Stennis. "Since ESAD scientists work with sensors and instruments that can be impacted by magnetic forces, they will, in

See **ESAD** Page 8



Members of the Retired Senior Volunteer Program (RSVP) recently visited Stennis Space Center. The group was treated to the stage presentation, "Oh My Stars, We've Landed on Mars"; a tour of StennisSphere, the award-winning visitor center; and lunch in the 1960s-style diner, the RocKeTeria. The seniors volunteer their services at special events and assist the visitor center staff at the Launch Pad at the Hancock County I-10 Welcome Center, the departure point for all tours of StennisSphere. From left, RSVP members Jo Shannon of Diamondhead, RSVP Director Jo Ann Lagasse and Virginia Pavolini of Hancock County discuss volunteer opportunities.



Speakers Bureau spreads word of Stennis activities

Jon Roth, assistant to the director at Stennis Space Center and a participant in NASA's Speakers Bureau, presented a program at the May 15 Gulfport Kiwanis meeting. Discussing Stennis' economic impact data are, from left, Dennis Oliver, retired, past lieutenant governor for Kiwanis' Division 14; Roth; Dr. Mark Shuttleworth, president, Gulfport Kiwanis and Gulfport chiropractor; and Sonya Ashley, secretary, Gulfport Kiwanis and Hancock Bank credit manager. For information about the Speakers Bureau, call Jeanie Maxwell at Ext. 8-1032.

IPD...

(Continued from Page 1)

"The goal of this IHRPT program is to satisfy our phase one milestones for doubling the capability of boost engines for access to space. IPD has also proven to be a very successful partnership between AFRL and NASA's Marshall Space Flight Center (MSFC), Huntsville, Ala., who is providing technical expertise and program support."

According to Capt. Thornburg, the IPD engine design is a technical first for the United States. The full-flow staged combustion engine brings together combustion device components from Aerojet and turbomachinery and system integration from Rocketdyne Propulsion and Power. Hydrostatic-bearing technology in the turbomachinery design and innovations from Aerojet incorporated into the combustion devices will extend the life cycle of the engine and reduce the amount of maintenance required between flights.

"The four-year testing program at Stennis will run in three phases," said NASA's Bruce Farmer, IPD test project manager at Stennis. "The first phase, already under way, will test the liquid oxygen turbopump.

The second phase, scheduled to begin testing in the August-September 2002 time frame, will test the liquid hydrogen turbopump. The final phase will be a series of tests on IPD's integrated system, which will incorporate the two turbopumps into an engine configuration. This testing series is scheduled to begin in December 2003 and will demonstrate the start-up and operating characteristics of a full-flow staged combustion rocket engine."

"This program will provide the opportunity for Stennis not only to perform critical testing for SLI, but also will demonstrate the first full-scale operation of E-1, the largest component test facility in the nation," said NASA's Robert Lightfoot, director of the Propulsion Test Directorate at Stennis. "The experience and lessons learned from this testing will be invaluable as we embark on several future SLI test programs to be done at E-1."

The goal of the Space Launch Initiative is to design a space transportation system that can meet NASA's needs with greatly increased safety and reliability and at a much lower cost than current systems. The IHRPT program is the DoD/NASA/industry-coordinated effort to develop revolutionary and innovative technologies by the year 2010 that will double rocket propulsion capabilities over 1993 state-of-the-art technology.

SURGERY...

(Continued from Page 1)

Once in place, the telemedicine system is simple to use. "It's as easy as picking up the phone," said Ridaught. "It's a simple international phone call."

Ridaught and a Stennis NISN technician tweaked the system for special needs. During one of the first operations performed using the telemedicine system, Sewell was having trouble communicating a particular point to the Japanese doctors, so he picked up a piece of paper and drew a picture to explain. The Stennis NISN technician who helped install and maintain the system in Jackson connected a document camera to transmit the image.

"This remote imaging project helps NASA learn more about these techniques and the real benefits of using such techniques," said Parsons. "One area NASA has been working to improve is our ability to perform telemedicine. There are many areas in which NASA human space flight and UMC can collaborate to improve the ability of humans to live and work in space."

Ridaught shares Parsons' enthusiasm for NASA's telemedicine efforts. "This is one of those projects that makes it all worthwhile," said Ridaught.



Annually, the Mississippi Gulf Coast region plays host to a variety of migratory birds. Recently, a family of Canadian geese took up residence near the A-2 liquid hydrogen barge dock. Mother Goose established a nest between the road and a transfer line. Father Goose, according to visitors and onlookers, stayed fairly close in the vicinity to defend his family's turf. The family produced four eggs. Two of the goslings are seen in the photo with their parents.



Before a hurricane threatens . . .

Before a hurricane threatens, there are ways to prepare.

Buy an alert radio: Consult an electronics dealer on purchasing a weather alert radio.

Know your escape route early: Know the number of hours it could take to evacuate during peak evacuation traffic. Consider leaving early to avoid congested highways.

Prepare drinking water: Fill clean, airtight containers to store sufficient water for several days.

Prepare a hurricane kit: Carry supplies and personal items to shelters if evacuation is necessary. The kit should include:

- ✓ manual can opener;
- ✓ matches;
- ✓ kitchen utensils;
- ✓ canned or packaged foods;
- ✓ first aid kit with extra prescription medicine;
- ✓ baby foods and formulas;
- ✓ water (for drinking purposes, four quarts per person per day);
- ✓ fire extinguisher;
- ✓ flashlights and extra batteries;
- ✓ cash or traveler's checks;
- ✓ tools — including hammer and nails;
- ✓ tarps; and
- ✓ sleeping bags and blankets.

QUICK LOOK

■ **Tour StenniSphere via the Web.** Stennis' newest virtual tour is available at www.ssc.nasa.gov/public/visitors. Tour StenniSphere, Stennis Space Center's award-winning visitor center, via its new Web site. The redesigned StenniSphere Web site conveys the many improvements to the visitor center since it reopened to the public in January.

F2M. . .

(Continued from Page 1)

actions rather than processes in identifying impediments to improved management within the Agency. "I promise you; we will move swiftly and surely," he said. "I ask that all of you do the same in support of this effort."

O'Keefe encouraged employees to continue to make suggestions and to identify barriers to the Agency's efficiency and effectiveness.

"Stennis has already made a number of

suggestions for improvements," said NASA's Ted Franklin, Stennis Space Center F2M representative. "While the F2M initiative has resulted in changes that range from the elimination of restrictions on travel to streamlined time and attendance reporting, there is still much to do. The process is very positive, and the outcome is encouraging."

This initiative is a results-oriented effort providing an opportunity where everyone can make changes to improve management. To submit a suggestion for an F2M improvement, go to www.f2m.nasa.gov/submit.htm or call Ext. 8-1622.

ESAD. . .

(Continued from Page 6)

cooperation with USGS, be able to anticipate geomagnetic anomalies often associated with increased solar activity. This information, relayed to government and commercial satellite operators, should allow them to schedule data collection, maintenance and diagnostic procedures that minimize the negative effects of geo-

magnetic disturbances on their sensors."

Adjacent to the Stennis magnetic observatory is a gravitation calibration site, one of many such stations that provide data used to benchmark absolute gravity, which changes slightly according to geographic conditions including subsurface rock density.

"Both projects are challenging and exciting developments for NASA in the area of sensor validation and verification," said Giardino.

LAGNIAPPE

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